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[54] **HAND HELD DOLL SIMULATING SKATING ACTION**

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[51] **Int. Cl.**[7] **A63H 13/12**; A63H 3/20

[52] **U.S. Cl.** **446/354**; 446/330; 446/338

[58] **Field of Search** 446/330, 331, 446/334–336, 338, 352, 354, 365; 40/419

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,599,364	8/1971	Garcia .	
3,660,931	5/1972	Gardel et al. .	
3,672,097	6/1972	Gerdel et al. .	
3,724,125	4/1973	Goldfarb et al. .	
3,728,816	4/1973	Ensmann et al. .	
3,769,745	11/1973	Crosman .	
3,775,900	12/1973	Thorn et al. .	
3,955,311	5/1976	Lyons et al. .	
4,003,158	1/1977	Wolf et al. .	
4,126,961	11/1978	Barlow et al. .	
4,305,222	12/1981	Terzian et al. .	
4,467,555	8/1984	Terzian et al.	446/158
4,559,021	12/1985	Wittenberg et al. .	
4,595,379	6/1986	Rasmussen et al.	446/341
4,608,026	8/1986	Newton et al. .	
5,042,807	8/1991	Sasakawa et al.	273/85 C
5,087,219	2/1992	Price .	

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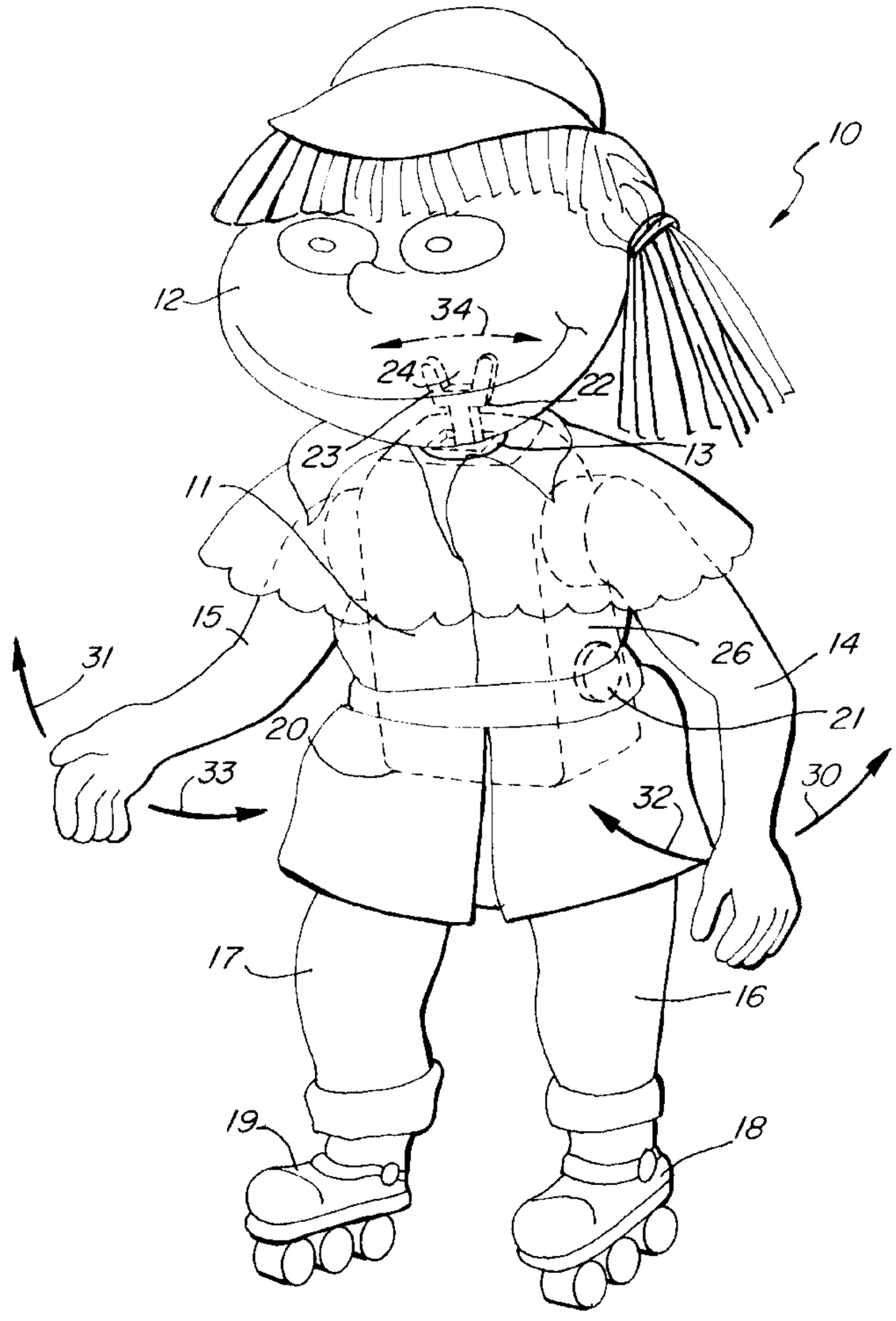
[57] **ABSTRACT**

A doll includes a torso supporting a pair of legs each having a simulated skate supported of the lower end thereof. The torso further supports a head which is coupled to a neck portion of the doll by a freely pivoting coupler. A housing within the doll torso supports a pivoting yoke coupled to a gear and rack drive mechanism. The gear rack is coupled to a depressible push button which the user actuates by squeezing the doll torso. A pair of arms are pivotally supported upon the torso and coupled to a gear drive mechanism responsive to the push button to move the arms back-and-forth in opposite pivotal directions as the push button repetitively squeezed and released.

11 Claims, 2 Drawing Sheets



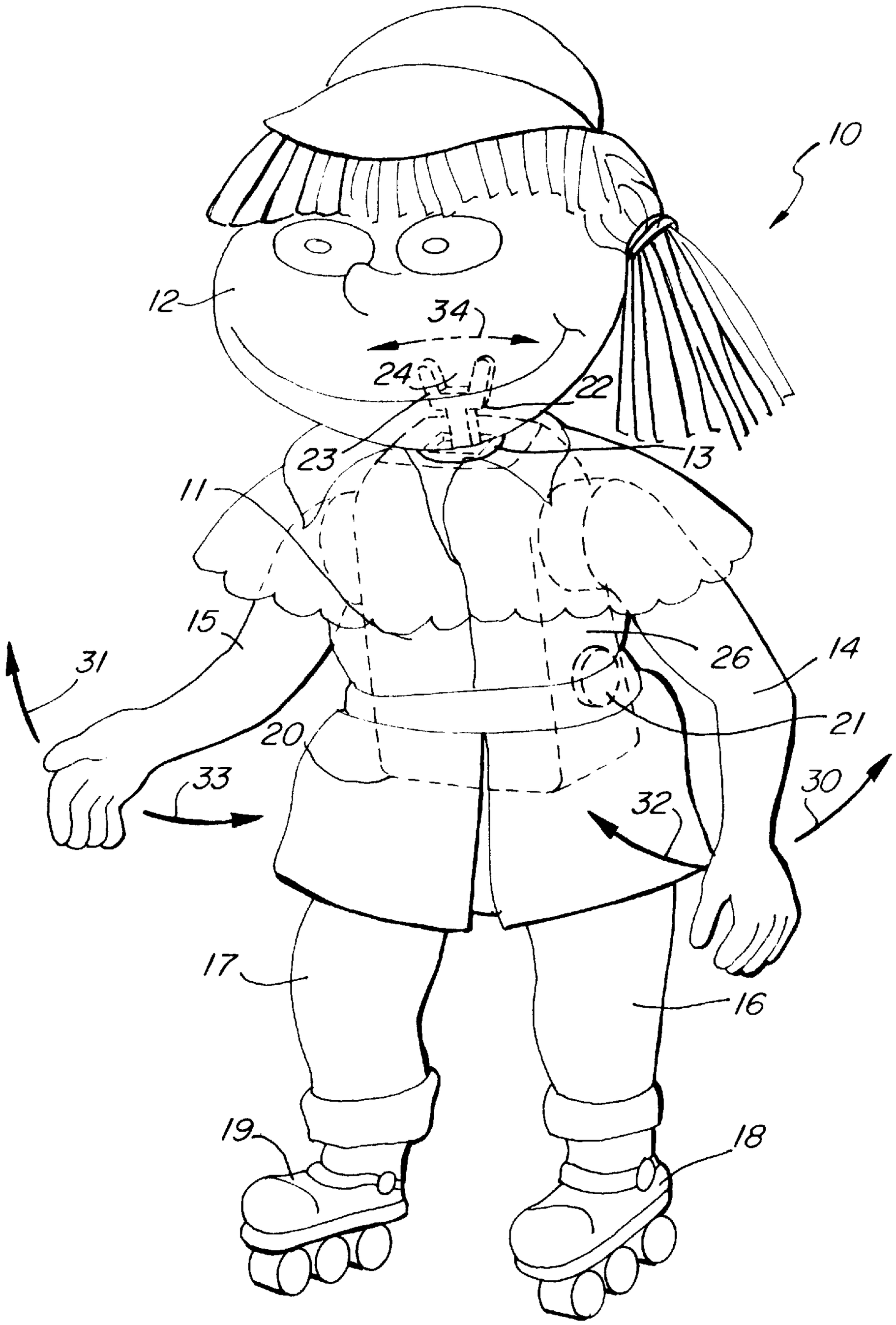


FIG. 1

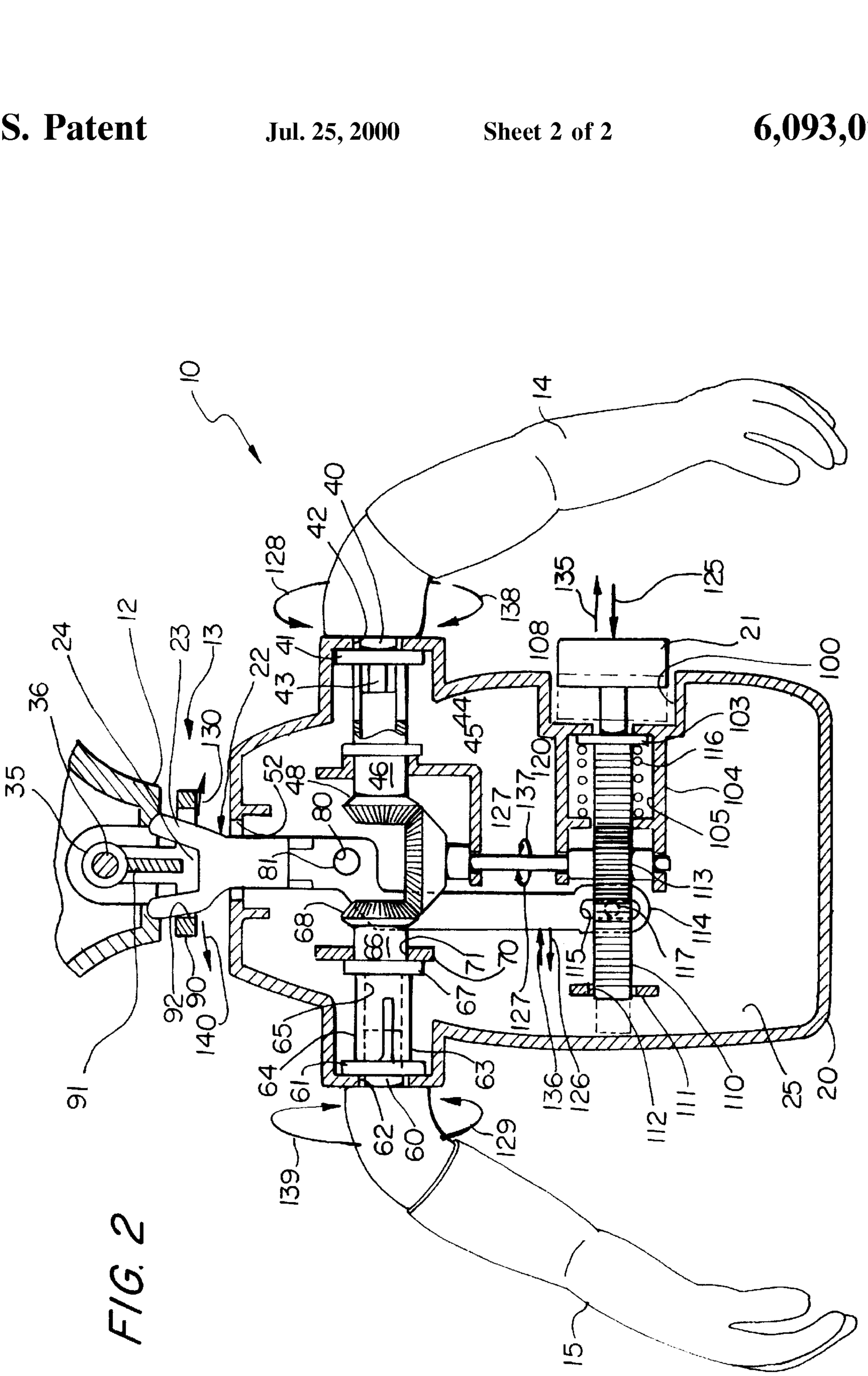

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FIG. 2

HAND HELD DOLL SIMULATING SKATING ACTION

FIELD OF THE INVENTION

This invention relates generally to articulated dolls and particularly to those employing a manually activated movement feature.

BACKGROUND OF THE INVENTION

Toy dolls are a long lasting and well known segment of the toy industry. Such dolls have enjoyed a virtually uninterrupted popularity among child users from earliest times to the present and give every appearance of continuing into the future. As a result of this sustained long term popularity, practitioners in the art have endeavored to provide a virtually endless variety of dolls. Thus doll have been provide which vary from large "life size" dolls to small fashion dolls. Further variation is found in the material of dolls varying from soft so-called "plush" dolls to hard plastic dolls and doll figures. The overall appearance theme has enjoyed corresponding variety extending from life-like realistic dolls to fanciful and cartoon-like dolls. By way of further variation, dolls have been provided that vary from passive dolls which lack any operative mechanism or feature to dolls which are extremely active and able to perform various movements or activities. Active dolls generally utilize some power source such as a spring driven wind-up motor or a battery powered electric motor mechanism. Still other dolls which are active, utilize a hand-powered mechanism for providing the necessary energy for doll activity. For example, U.S. Pat. No. 3,724,125 issued to Goldfarb et al. sets forth a PUSH BUTTON DOLL having a body supporting a plurality of limbs and a spring loaded button accessible from the front of the doll. Means individually connect each of the limbs and head of the doll to the button such that the limbs and head move in response to depression of the button.

U.S. Pat. No. 4,126,961 issued to Barlow et al. sets forth a ARTICULATED DOLL having a torso and head mounted upon the torso. A universal connection is utilized to secure the head which permits nodding, twisting and universal movement of the head relative to the torso. A singular manually manipulatable mechanism is mounted on the torso for movement of the head through a linkage system.

U.S. Pat. No. 3,728,816 issued to Ensmenn et al. sets forth a CLAMORING DOLL having a spring motor and drive train to animate the arms and head of the doll. The arms are pivoted for a up and down motion and the drive train includes a spring loaded yoke connected to drive the arms through the required arcuate displacement.

U.S. Pat. No. 4,559,021 issued to Wittenberg et al. sets forth a POSEABLE HEAD DOLL having a base resembling the upper torso and shoulders of a human-like figure together with a head rotatable supported upon the neck portion of the base. Drive means within the base are operative to pivot and pose the doll head.

U.S. Pat. No. 3,769,745 issued to Crosman sets forth a TEARING DOLL WITH ROTATABLE HEAD includes a resilient reservoir supporting a liquid such as water within the doll operatively coupled to tear ducts in the dolls eyes which is operated as the dolls head is turned to simulate crying.

U.S. Pat. No. 3,955,311 issued to Lyons sets forth a MECHANISM FOR MOVING AN UPPER APPENDAGE OF A TOY FIGURE having a push button on the upper side of the figures torso which is hand operated. By pushing the button motion is transmitted to a lever which is rotated upwardly. The upward motion of the lever is translated into rotary motion of a ball joint connected to an upper arm of the figure.

U.S. Pat. No. 4,003,158 issued to Wolf et al. sets forth a FIGHTING DOLL having an upper torso rotatably secured to a lower torso. Actuating means within the doll cause the upper torso to pivot relative to the lower torso. The doll further includes a pair of freely moveable arms secured to the torso. The relative movement of the upper torso swings the arms to provide movement thereof.

U.S. Pat. No. 4,608,026 issued to Newton et al. sets forth a FIGURE WHEREIN MANIPULATION OF ONE LIMB CAUSES MOTION OF ANOTHER having a torso supporting downwardly extending legs and outwardly extending arms. The legs are pivotable toward and away from each other and are coupled to a mechanism which converts movement of one of the legs into arm motion using a squeeze and release play pattern.

U.S. Pat. No. 5,087,219 issued to Price sets forth a ACTION CHARACTER FIGURE having a torso portion, a rotatable arm portion on the torso portion and a leg portion which is retractable into the lower end of the torso portion. The arm is connected to the leg portion such that rotation of the arm causes the leg portion to be retracted into the torso portion against the force of an internal spring.

While the foregoing described prior art dolls have improved the art and in some instances enjoyed commercial success, there remains nonetheless a continuing need in the art for ever more interesting, amusing and entertaining hand held type dolls.

SUMMARY OF THE INVENTION

Accordingly, it is a object of the present invention to provide an improved hand held doll. It is a more particular object of the present invention to provide an improved hand held doll which includes an action figure allowing a skating type activity to be undertaken.

In accordance with the present invention there is provided a hand held doll comprising: a torso having a pair of arms pivotally supported thereon, a head, a pair of legs extending downwardly therefrom, a neck portion pivotally supporting the head, and an interior cavity; a coupler supported by the head; and a drive mechanism having a housing received within the interior cavity and a movable button, the drive mechanism including a gear rack movable with and joined to the button, a return spring urging the button outwardly, gear means rotatably engaging the gear coupled to the arms to pivot the arms and lever means coupled to the gear rack and the coupler, the button being alternately pushed and released to cause the head to be moved side-to-side and the arms to move front-to-back.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

FIG. **1** sets forth a front perspective view of a hand held doll simulating skating action constructed in accordance with the present invention;

FIG. **2** sets forth a partial section view of the upper torso and operative mechanism of the present invention hand held doll simulating skating action.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. **1** sets forth a front perspective view of a hand held doll constructed in accordance with the present invention and generally referenced by numeral **10**. Doll **10** includes a torso **11** having a neck **13** supporting a head **12**. Torso **11** further supports a pair of arms **14** and **15** and a pair of legs **16** and **17**. Legs **16** and **17** support a pair of skates **18** and **19** respectively.

In accordance with the present invention, a housing **20** is supported within a torso **11** and includes a push button **21**. Housing **20** further supports a vertically extending yoke **22** having a fork **23** on the upper end of yoke **22** which in turn defines a gap **24**. As is set forth below in greater detail, the internal mechanism within housing **20** which is operated by push button **21** moves yoke **22** and head **12** from side-to-side as indicated by arrows **34**. In addition, the action of pushing and releasing push button **21** causes arms **14** and **15** to pivot back-and-forth in opposite directions as indicated by arrows **30** through **33**. Thus, as arm **14** pivots rearwardly in the direction indicated by arrow **30**, arm **15** pivots forwardly in the direction indicated by arrow **31**. Conversely, as arm **14** pivots forwardly in the direction indicated by arrow **32**, arm **15** pivots rearwardly in the direction indicated by arrow **33**.

The operative mechanism within housing **20** is set forth below in FIG. **2** in greater detail. However, suffice it to note here that the operative mechanism within housing **20** responds to the action of pushing and releasing button **21** on the part of the user to move arms **14** and **15** in pivotal motion about their respective shoulder attachment and to move head **12** back-and-forth as indicated by arrows **34** through a pivotal motion of yoke **22**. Thus in operation, the user is able to grasp torso **11** with a hand grip facilitating pressing and releasing button **21**. Button **21** is supported beneath a flexible garment **26** formed of a flexible cloth or fabric or the like. Thus as the user squeezes and relaxes the grip upon torso **11**, push button **21** is repeatedly depressed and released giving rise to the above described arm motion and head motion characteristic of a skating action.

Legs **16** and **17** of doll **10** are not operatively coupled to housing **20** and are passive. Preferably legs **16** and **17** are somewhat pivotal in their attachment to torso **11** such that the user is able to induce motion of legs **16** and **17** as the user moves doll **10** across the play surface. Of importance with respect to the present invention, however, the atainment of doll simulating a skating action without the prohibitly costly drive and support mechanisms required by prior art skating dolls. Doll **10** is included to meet the need for more interactive hand held dolls as opposed to more sophisticated and costly skating dolls which operate on their own. By providing a hand held doll to simulate skating action, which does not utilize the complex and expensive drive mechanism of conventional skating dolls, the present invention doll provides a hands-on feel together with increased play value and imagination on the part of the user.

FIG. **2** sets forth a partial section view of doll **10** showing the internal mechanism operative within housing **20**. It will be recalled that housing **20** is supported within torso **11** of doll **10** in the manner shown above in FIG. **1**. Housing **20** defines a recess **100** within with a push button **21** is moveable supported. Housing **20** further defines an aperture **101** and a drive housing **104** formed within an interior cavity **25** of housing **20**. Drive housing **104** defines an internal passage **105** within which an aperture **108** is formed.

A shaft **102** extends inwardly from push button **21** through aperture **21** and is joined to a flange **103**. Flange **103** is larger than aperture **101** captivating flange **103** within passage **105**. A gear rack **110** is joined to flange **103** and extends through passage **105** and aperture **108** and beyond drive housing **104**. Gear rack **110** also extends through aperture **112** formed in plate **11** within interior cavity **25**. A generally cylindrical pin **117** extends downwardly from the undersurface of gear rack **110**. A spring **116** captivated within passage **105** produces a spring force which urges flange **103** and shaft **102** outwardly to position push button **21** in the extended position shown in solid-line representation.

Yoke **22** defines a fork **23** having a center gap **24** formed therein. Yoke **22** defines an aperture **80** which is received upon a pivot post **81** formed in housing **20** within an interior cavity **25**. Thus yoke **22**, is pivotably supported upon post **81**. Yoke **22** is elongated and includes a lower end **114** having an elongated slot **115** formed therein. End **114** of yoke **22** is positioned beneath gear rack **110** such that pin **117** thereof is received within slot **115**.

A gear **113** is rotatably supported upon drive housing **104** in engagement with gear rack **110**. A shaft **120** couples gear **113** to a bevel gear **121**.

Bevel gear **121** engages a pair of bevel gears **48** and **68**. Bevel gear **48** is rotatably supported by a baring **46** received within aperture **51** of plate **50**. Plate **50** is supported within interior cavity **25** in accordance with conventional fabrication techniques. Baring **46** further includes a flange **47** having a diameter greater than aperture **51** of plate **50**. A shaft **44** having an internal passage **45** extends outwardly from flange **47**.

Arm **14** includes a baring **40** received within aperture **42** formed in housing **20**. A flange **41** is integrally formed with baring **40** and further supports an inwardly extending hexagonal head **43**. In the preferred fabrication of the present invention, passage **45** is configured to be received upon and engage head **43** such that the combined structures of baring **40**, shaft **41**, head **43**, shaft **44**, flange **47**, baring **46** and bevel gear **48** rotate as a single rotational element.

In a similar fashion, bevel gear **48** is coupled to a baring **66** rotatably supported within an aperture **71** formed in a plate **70**. Plate **70** is supported within interior cavity **25** in accordance with conventional fabrication techniques (not shown). Baring **66** further includes a flange **67** joined to a shaft **64**. Shaft **64** defines a bore **65** received upon a head **63** of flange **61**. A baring **60** is joined to flange **61** and arm **15** and is rotatable within aperture **62** of housing **20**.

Head **12** is pivotally coupled to a coupler **90** by a pivot pin **96**. Coupler **90** includes an aperture **92** receiving fork **23** of yoke **22**. Coupler **90** further includes a downwardly extending rib **91** extending into gap **24** of fork **23**. In accordance with the preferred fabrication of the present invention and the operation thereof described below in greater detail, the use of coupler **90** in association with head **12** and fork **23** provides a loose coupling therebetween which facilitates movement of head **12** under the urging of fork **23** while simultaneously providing a freely pivotal attachment for head **12**. The result is an unusual head motion which is characteristic of a skater.

In operation, and assuming initially that no force is applied to push button **21**, spring **116** forces flange **103** outwardly against aperture **101** thereby positioning push button **21** in the extended position shown in solid-line representation. Because gear rack **110** is joined to flange **103** gear rack **110** is positioned in the manner shown in solid-line representation. The action of doll **10** commences as the user applies a squeeze force to torso **11** (seen in FIG. **1**) thereby

exerting an inward force upon push button **21** in the direction indicated by arrow **125**. When the squeeze force applied to push button **21** is sufficient to overcome the force of spring **116**, the combined structure of push button **21**, shaft **102**, flange **103** and gear rack **110** is moved in a corresponding movement in the direction of arrow **125**. This movement of gear rack **110** moves end **114** of yoke **22** in the direction indicated by arrow **126** due to the coupling of pin **117** into slot **115** thereof. With end **114** moved in the direction indicated by arrow **126**, fork **23** of yoke **22** is pivoted about pivot post **81** in the direction indicated by arrow **130**.

In addition of movement of yoke **22** to pivot head **12**, the movement of gear rack **110** in the direction indicated by arrow **125** rotates gear **113** and shaft **120** in the direction indicated by arrow **127**. As a result, bevel gear **121** is correspondingly rotated in the direction of arrow **127**. The engagement of gear **48** against bevel gear **121** causes the rotation of gear **121** to rotate gear **48** together with baring **46**, flange **47**, shaft **44**, head **43**, flange **41**, baring **40** and arm **14** in the direction indicated by arrow **128**. Correspondingly, the rotation of bevel gear **121** rotates gear **68** causing the combined structure of gear **68**, baring **66**, flange **67**, shaft **64**, head **63**, flange **61**, baring **60** and arm **15** to rotate in the direction indicated by arrow **129**. It will be noted that the rotation of arms **14** and **15** are in opposite directions due to the mutual couplings of gears **48** and **68** to bevel gear **121**.

Once push button **21** has been fully depressed and released, the force of spring **116** urges the combined structure of flange **103**, gear rack **110**, shaft **102** and push button **21** outwardly in the direction indicated by arrow **135**. This motion of gear rack **110** moves end **114** of yoke **22** in the direction indicated by arrow **136** while simultaneously rotating gear **113** in the direction indicated by arrow **137**. The movement of end **114** in the direction of arrow **136** pivots yoke **22** about post **81** in the direction indicated by arrow **140** imparting an oppositely tilting motion to head **12** through coupler **90**.

Simultaneously, as gear **113** is rotated in the direction indicated by arrow **137**, shaft **120** and bevel gear **121** are correspondingly rotated. The rotation of bevel gear **121** in the direction indicated by arrow **137** results in rotation of gear **48** and arm **14** in the direction indicated by arrow **138**. Similarly, rotation of bevel gear **121** in the direction indicated by arrow **137** rotates bevel gear **68** and arm **15** in the direction indicated by arrow **139**.

Thus as can be seen, the repetitive squeezing and releasing of the doll torso producing repetitive depressing and releasing of push button **21** results in back-and-forth pivotal movement of head **12** and front-to-back offset pivotal movements of arms **14** and **15** about their respective shoulder attachments. The placements of push button **21** in the manner shown relative to torso **11** (seen in FIG. **1**) is selected to facilitate a natural tendency for the user playing with doll **10** to grip the doll at the waist portion at its torso and move the doll along a play surface in a imaginary skating play activity. The realism of action provided by arm motion back-and-forth and head motion from side-to-side is recognizably characteristic of skating action and thus adds amusement and entertainment to the present invention doll. The mechanism provided is a simple hand held mechanism which avoid the high cost and complexity associated with skating dolls that are freely moveable and independently capable of skating. The hand held nature of the present invention doll provides the child user with a more interactive and challenging manipulation of the doll to provide a simulated skating action.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

That which is claimed is:

1. A hand held doll comprising:

a unitary torso having a pair of arms pivotally supported thereon, a head, a pair of legs extending downwardly therefrom, a neck portion pivotally supporting said head, and an interior cavity;

a coupler supported by said head; and

a drive mechanism constructed to move said head and arms relative to said torso without moving said torso, said drive mechanism having a housing received within said interior cavity and a movable button, said drive mechanism including a gear rack movable with and joined to said button, a return spring urging said button outwardly, gear means rotatably engaging said gear rack coupled to said arms to pivot said arms and lever means coupled to said gear rack and said coupler for moving said head relative to said torso,

said button being constructed to cause said head to be moved side-to-side relative to said torso without causing said torso to be moved and said arms to move front-to-back when said button is alternately pushed and released.

2. The hand held doll set forth in claim **1** wherein said gear means include:

a first gear and first shaft, said first gear engaging said gear rack;

a second gear coupled to said first shaft; and

a third gear and forth gear each engaging said second gear and one of said arms in said pair of arms.

3. The hand held doll set forth in claim **2** wherein said lever means includes a yoke defining an upper end received within said coupler, a lower end engaging said gear rack and a pivotal support intermediate said upper and lower ends.

4. The hand held doll set forth in claim **3** wherein said lever means includes a slot formed in said lower end of said yoke and a post extending from said gear rack into said slot.

5. The hand held doll set forth in claim **4** wherein said coupler includes a center rib and wherein said upper end of said yoke includes a fork having a gap therein receiving said rib.

6. The hand held doll set forth in claim **5** wherein said first gear rotates said second and third gears in opposite directions.

7. The hand held doll set forth in claim **6** wherein said first, second and third gears are bevel gears.

8. The hand held doll set forth in claim **1** wherein said lever means includes a yoke defining an upper end received within said coupler, a lower end engaging said gear rack and a pivotal support intermediate said upper and lower ends.

9. The hand held doll set forth in claim **8** wherein said lever means includes a slot formed in said lower end of said yoke and a post extending from said gear rack into said slot.

10. The hand held doll set forth in claim **9** wherein said gear means include:

a first gear and first shaft, said first gear engaging said gear rack;

a second gear coupled to said first shaft; and

a third gear and forth gear each engaging said second gear and one of said arms in said pair of arms.

11. The hand held doll set forth in claim **8** wherein said coupler includes a center rib and wherein said upper end of said yoke includes a fork having a gap therein receiving said rib.

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